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Forest Insect Investigations

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WHAT IS AN EPIDEMIC OF BARK BEETLES?

By

M.W.Blackman

Noah Webster in his handy little compendium of the English language defines an epidemic as a disease common to or affecting many in a community.

Forest entomologists in the past have adopted the term epidemic and have applied it to outbreaks of various insects capable of seriously injuring or killing forest trees. Perhaps the application of this term to infestations of insects is hardly defensible from the standpoint of pure English, but a term descriptive of the conditions found was much needed and the general similarity of the course of certain insect infestations to the course of an epidemic disease was so apparent as to make the general meaning of the term "insect epidemic" readily understandable.

But exactly what do we mean by the term "epidemic"? One forest entomologist will tell you that an epidemic condition exists where more than ten trees are being killed per year per section. Another places the figure at 60 trees per year per section. Still another says a forest insect is epidemic when it kills more than one half of one percent of the trees of an area per year.

For practical purposes in connection with control work one or another of these definitions is perhaps the best possible for an infestation of the particular species of barkbeetle at hand. But each of these definitions was arrived at arbitrarily and was made for practical use rather than to stand the test of scientific scrutiny.

In our own work on the Kaibab last summer, we assumed - also more or less arbitrarily - that an epidemic condition of the Black Hills Beetle existed when trees were killed in groups of four or more. During the summer the writer took 500 increment cores from trees killed by the 1925 attack of the beetles and from adjacent green trees similar in size, site and general character. These cores were taken in group killings ranging from one to thirty-two trees and the results were summarized on the basis of the size of the group of killed trees. In groups of one to three trees killed the dead trees showed an average growth - as measured by the number of rings in the last half inch radius - 25.9 per cent slower than the green trees. All groups of from 1 to 6 trees killed, showed slower growth in the killed trees ranging from 6.8% to 27.9% slower than in the green trees. In groups of seven or more trees the averages for all groups shows an appreciable more rapid growth in the killed trees than in the green trees.

This data would seem to suggest a scientific definition for the term "epidemic" as applied to the Black Hills Beetle, but I am certain it will not stand up when applied to other insects even of the same genus. Let us see how it sounds, however; - "A bark beetle infestation is epidemic when it occurs in sufficient numbers and is aggressive enough to kill trees without apparent choice of the less vigorous trees". That seems to fit D. ponderosae very well. Let us hear from workers on other forest insects.

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SLASH DISPOSAL IN YELLOW PINE.

During the past summer some attention was given to the beetle aspects of this problem in yellow pine in Oregon and Washington. On private cuttings where the slash was left as it fell without burning there was surprisingly little beetle damage to either the reproduction or the young and mature timber. The problem is so complicated that cursory observations are not of great value.

A.J. Jaenicke

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HEAVY ATTACK - NO PITCH TUBES.

During the survey on the Bitterroot National Forest in August, it was found that on some of the heavier infested areas, the attacks of the mountain pine beetle in both lodgepole and yellow pine had been so severe that there were practically no pitch tubes whatever. On the lodgepole pine there were a few small granule-like pitch tubes which could not be seen unless a very close examination was made. In view of this fact it was necessary to depend upon the boring dust at the base of the trees as an indication of infestation. However, in many areas, it was only necessary to count the number of trees within the strip in order to secure the number of 1926 attacked trees.

J.C. Evenden

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MILD WINTER - MORE BUGS.

While definite figures are lacking it is believed the mild winter of 1925-26 favored the overwintering of a larger number of parent adults than usual. The insect referred to was Dendroctonus monticolae in lodgepole pine on the East Fork of the Bitterroot River. These parent adults after their winter inactivity extended their egg galleries, in many cases starting the new section with the characteristic hook of a new gallery.

To determine what might be expected if these overwintering adults were liberated by the ordinary method of treating, peeling the infested length, a number were collected and liberated in a cage containing freshly cut logs of lodgepole pine. A subsequent examination showed they had attacked the log and had started gallery construction and egg laying. An unusual feature of their attack was the fact that many of them avoided making an entrance hole by starting their gallery between the bark and the wood at the end of the log.

To what extent natural conditions are upset by the log rather than the standing tree, is problematical. The standing tree may offer sufficient resistance to drown out the lowered resistance of overwintering adults, or the numbers attacking may be too small to make a successful attack. If it is found that overwintering adults are in sufficient numbers and can make a successful new attack and lay sufficient eggs to produce a fair sized progeny the present method of control by peeling the infested length would not result in 100% control. What proportion of the brood is laid in the spring and whether they will mature is not definitely known. What will hold good for one mild season would not apply to another owing to the difference in mildness of winters and consequent survival of the parent adults.

A.L. Gibson

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DOES DENDROCTONUS MONTICOLAE PREFER PORCUPINE GIRDLED TREES?

In studying the habits of Dendroctonus monticolae in connection with the control of this beetle in lodgepole pine in the Crater Lake Park during the past season, an opportunity of noting the prevalence of attacks on porcupine girdled trees was offered. We have all noticed the work of porcupines in pine timber though the damage caused by the rodent is usually confined to seedlings and small trees. In the Crater Lake Park the porcupines appear to be more ambitious in their feeding habits for they attack trees up to two feet in diameter. Very often they completely girdle the trunk.

During the course of the control work on the Crater Lake project, 107 girdled trees, all between 6 inches and 2 feet in diameter were encountered. These trees had been nearly or completely girdled by strips ranging from 2 inches to a foot or more in width, and heights of from one to eight feet above the ground. In all cases the outer bark had been completely removed from the girdled strips, since porcupines are interested in reaching the cambium layer. Some of these trees had been girdled last winter and spring, others were barked sometime during the preceding year; while still others had yet older wounds. The wounds made by the porcupines were not fatal to the trees, for only those which were later attacked by beetles were killed.

Of the 107 girdled trees in the series examined only 16 or 15% had been attacked by Dendroctonus monticolae during the past two years. These figures would indicate that porcupine girdled trees are no more attractive to these beetles than trees which had sustained no injury. The attack of porcupine girdled trees by this beetle is evidently then not the result of attraction but is the result of their location in areas of concentrated infestation - merely a matter of chance.

J.E. Patterson.

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NOTES FROM OREGON.

During the past summer the madrone (Arbutus menziesii) throughout the Willamette Valley of Oregon has been badly infested by the tiny madrone leaf miner Coptodisca arbutiella Bask.

The native Oregon oak (Quercus garryana) was more or less severely defoliated throughout the central Willamette Valley from a point at least 10 miles north of Corvallis to at least 40 miles south, by what is apparently an undescribed species of Gracilaria. In the bottom lands thousands of caterpillars could be seen suspended from the oaks in late May. They spread from the oaks to maple, ash and many shrubs which served as hosts for a brief period prior to pupation.

W.J. Chamberlin.

KLAMATH CONTROL A SUCCESS.

An insect survey of the yellow pine region west of the Klamath Lakes in southern Oregon has recently been completed. This survey was made upon request of Mr. J. F. Kimball of the Klamath Forest Protective Association who is directing control work in this region for the Weyerhaeuser Timber Company and the Long-Bell Lumber Company. Both these companies own extensive acreage of yellow pine timber in the region. A very interesting feature of the data secured was the contrast between the intensity of the present western pine beetle infestations on the areas controlled last winter and spring and that of the infestations on adjacent uncontrolled areas. In general the 1926 infestations throughout this entire region is 25% higher than the infestation of 1925. Yet despite this general increase the present infestation on the areas where control work was carried out last winter and spring is down to normal. This situation certainly speaks well for control work.

J.E.Patterson.

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WHITE ANTS ALLIES OF SATAN.

Depredations of termites (white ants) last year closed St. Boniface's Catholic Church, Edwardsville, Illinois, and pillars and beams supporting the roof had to be rebuilt. The structure of brick was erected in 1869. * * * The ants had gnawed the inside of four large carved wood pillars supporting the roof of the church, leaving mere shells. Each pillar carried a mean roof load of 1,600 pounds and engineers considered it remarkable that the roof did not collapse. Fortunately, no heavy snows fell during the winter, which probably accounted for the roof holding up.

The Literary Digest.

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COEUR D'ALENE NOTES.

The personnel of the Coeur d'Alene Station have all returned from the field following a very busy season. With the addition of Miss Dorothy Bowder to our station force as Junior-Clerk Stenographer we have settled fairly well into the usual routine of our winter's work. At the present time the writer is trying to catch up with the station work neglected during the summer and to prepare the reports of the insect surveys conducted during August and September. Mr. Gibson is surrounded with a maze of data which he is constantly battling with the ever faithful sliderule. Mr. Rust, is as usual, our indispensable handy man and when not helping Mr. Gibson or myself with maps, et cetera, is working on data secured in connection with his studies of the mountain pine beetle in white pine.

J.C.Evenden.

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CYPRESS BARKBEETLE IN SAN JOAQUIN VALLEY.

Several Monterey cypress were recently noticed at Reedley, Cal., which had been heavily attacked and killed by Phloeosinus cristatus. These planted trees were the only cypress within a considerable radius. The new adult beetles which emerged from the cypress made an attack upon the foliage of an incense cedar that was growing a short distance away. This attack consisted of mining the stems of small twigs and is considered to be a feeding or hibernating habit of Phloeosinus beetles. No attacks were made upon the cambium of the trunk or limbs of the cedar.

So far we have no record of P. cristatus attacking incense cedar and this attack seems to have been due to an abnormal condition. One interesting phase of this record is the fact that the barkbeetle became established in a locality where it had not existed before. Monterey cypress has been planted only at widely separated points in this part of the valley and the beetles must have covered a considerable gap in their distribution to reach this locality.

J.M.Miller.

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WILL OUR FIELD AND OFFICE WORK BALANCE?

I have often wondered as to the proper proportion of field and office work which would permit of the efficient preparation of reports, writing of articles for publication, et cetera. How much time should one have in the office to properly balance his field work? This will vary with different officers in the Bureau as the character of their office work is different. The following is a tabulation of field service of the personnel of this station from January 1st to October 15th:

Name	Days in Field	% of year in field.	Days in office less Sundays and annual leave if taken.	Days in office for each day in field.
J.C. Evenden	145	39.8	184	1.27
A.L. Gibson	175	44.8	148	.85
H.J. Rust	145	39.8	184	1.27

In this table Sundays have not been eliminated from field work as in most cases duty is performed on those days. On the other hand holidays have not been charged against office work. I wonder if our field work does not over balance our office work and if so will it not answer the criticism which is so often offered against us that we never publish our data.

J.C. Evenden.

PEAGIE TRENCHES.

The Mono and Piute Indians were highly insectivorous in their food habits and some of their collecting methods might be profitably studied. On the east side of the Sierra Nevadas, caterpillars of the Pandora Moth, known as "peagies" in the Indian vocabulary, were highly prized as an article of diet. The mature larvae were collected as they came down the tree to enter the ground and pupate. The caterpillars were then killed in hot water, dried, and stored for use as needed, the product somewhat resembling well cured raisins in appearance.

One of the favorite collecting grounds for this material was the Jeffrey pine forest growing on loose pumice soils near the Mono-Inyo Forest boundary. Apparently the Pandora Moth has never been abundant in this locality as the trees show no evidence of old or recent defoliations. The process of collecting the caterpillars seem to have been speeded up by digging circular trenches in the loose soil about the base of the trees. These trenches were about eight inches to a foot in depth, the inner bank sloping away from the tree, the outer bank forming a nearly vertical wall. The larvae coming down the trunk and trying to crawl away were unable to scale the outer bank of the trench, so they remained in the bottom and were collected at the convenience of the Piute squaws. The exodus of the larvae from the trees to the ground was considerably hastened by burning the pine needles under the trees.

The Peagic industry seems to have been largely discontinued by the present day Indians. In a recent field trip on the Inyo with Ranger Simpson we came upon one of these worming grounds which apparently had been out of use for many years. Over hundreds of acres every tree over two feet in diameter at the base was surrounded by one of these ancient trenches. The growth of brush and accumulation of forest litter had largely obscured many of them except where a recent fire had burned off the cover.

J.M.Miller.

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THE BREVICOMIS SITUATION IN OREGON AND WASHINGTON.

The more important western pine beetle infestations in the yellow pine of Oregon include:-

1. Burnt River infestation on the Whitman N.F. in northeastern Oregon.
2. North Fork of Malheur River infestation on the Malheur N.F. in northeastern Oregon.
3. The Metolius infestation on the Deschutes N.F. in central Oregon.
4. The southern Oregon infestation in Klamath and Lake Counties.

The first three of these infestations are rapidly decreasing. The decline began in the spring of 1925. The memorable cold snap of December, 1924, unquestionably was responsible for this to some extent.

In southern Oregon there is no improvement in the situation on these epidemic areas on which no control work has been done.

In Washington, the Chelan N.F. in the north central part of the state continues to be the most badly beetle-ravaged forest in Oregon and Washington. Unfortunately, the region timber values and the urgency of control work elsewhere do not justify control measures.

A.J.Jaenicke.

FIFTH ANNUAL SURVEY.

The Forest Service and the Klamath Forest Protective Association are cooperatively undertaking the fifth annual beetle survey of all of the yellow pine timber in Klamath and Lake Counties outside of the boundaries of the present southern Oregon pine beetle control project. Loss figures are now available for the five year period 1921-1925 inclusive. An estimate of the 1926 losses will be made in the present survey.

The following are the more pertinent data regarding the survey:

Acresage -

Private	962,000 acres
Gov't.	<u>2,186,000 acres</u>
Total	3,148,000 acres

Timber Stand (Yellow Pine)

Total	17,390,000 M board feet.
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Beetle Losses (1921-1925 inclusive)

Total	281,500 M board feet.
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On the endemic areas, the annual average beetle loss in yellow pine amounted to slightly more than one third of one percent of the stand. On the epidemic areas the average annual loss equalled one per cent of the yellow pine volume.

The fifth annual survey was started on October 21 and will probably be completed about the first of December. The writer and an assistant from the Klamath Forest Protective Association are doing the field work.

A.J. Jaenicke.

NEW TIMBER-DESTROYING INSECT.

Elko, Nev. Oct.13 - Forest Service officials have discovered that a blight caused by a microscopic insect has killed much timber near Hyllech, Nev. The disease is said to spread rapidly and all trees attacked soon die.

The Timberman.

CABLE BEETLE AT WORK AGAIN.

According to newspaper reports the early fall rains placed fifty phones at Los Gatos, Calif., out of service. The trouble was caused by water getting into one of the principal cables and short circuiting the individual lines. The water got into the cable through holes made in the lead sheath of the cable by the California lead cable beetle, Scobicia declivis, Lec. All of the holes were made in the lower side of the cable close to where it came into contact with the galvanized iron suspension rings.

H.E. Burke.

CURRENT LITERATURE

Belyea, H.C. and MacIlhenny, H.J. - Weather Injury to Terminal Buds of Scotch Pine and Other Conifers, Jour. For., XXIV, Oct., 1926, pp. 685-690.

A study of the relationship of frost injury to what has formerly supposed to be weevil injury, 75% of the total injury to scotch pine is due to frost.

Chamberlin, W.J. - Catalogue of the Buprestidae of North America north of Mexico. pp 7-289, 1926.

A valuable reference work containing a list of all species known to inhabit North America north of Mexico and their synonymy, bibliography, distribution, type localities and host plants.

Essig, E.O. - Insect of Western North America, pp. 1-1035. figs. 1-766.

Notes on many forest insects, numerous illustrations. Indispensable to all western entomologists.

Felt, E.P. - A new Spruce Gall Midge (Itonididae) Com. Ent. LVIII, Sept. 1926. pp. 229-230.

Description and biological notes of Phytophaga picea which injures white spruce in eastern Canada.

Hopping, George R. - A new Melosis with a Key to the Species (Coleoptera). Com. Ent. LVII, Sept. 1926. pp. 225-228 fig.

Description of melosis turgae, new species of cross borer, with notes on the life history and a key to the species of the genus. Inhabits the hemlock in British Columbia.

Patterson, J.E. - Micrometer Slide adopted to Core Measuring. Jour. For. XXIV Oct., 1926, pp. 691-692 figure.

Description of machine used at Palo Alto Forest Insect Laboratory.

Wells, A.B. - Notes on Tree and Shrub Insects in Southwestern Pennsylvania. Ent. News. XXXVII, Oct. 1926, pp. 254-258.

Short biological notes on a number of species.

Notes of the white pine tube builder, Eulia pinatubana, Kearf., were observed April 15 and July 15, 1925, there being two broods, the caterpillars of the second brood hibernating in the tube made of webbed needles.

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REPORTS

Keen, F.P. - Report of Western Pine Beetle Survey, Happy Camp-Laba Bed Area, Modoc National Forest, October, 1926.

Miller, J.M. - Report of Windfall Damage and Subsequent Insect Infestation of the Mono Lake - Owens River Working Circle.

FOREST ENTOMOLOGISTS! TAKE NOTICE.

When an old, experienced entomologist dies, the world often loses a great store of very useful knowledge simply because he has not put it on record. He may have published many large monographs or other papers, but he must have made many interesting observations never recorded which would have helped to fill chinks in our biological or ecological knowledge or which would have attracted the attention of other observers, perhaps in other countries, and have induced them to try to make parallel observations on the same or related forms.

The dislike to "rush into print" is pronounced with many able men and many close observers. Many make careful notes which never reach the display of type and are lost to the world.

Progress towards a complete understanding of the so-called "works of nature" is made perhaps no more by the publication of great monographs than by a recording in print from time to time of isolated observations which will incite the publication of parallel or confirmatory observations elsewhere and which will subsequently be worked into a logical and understandable whole.

My belief in the importance of prompt publication of short notes is growing stronger. It has happened several times in the last dozen years that such publication of an isolated observation has brought forth others from different parts of the world with the result that, when correlated, we have found ourselves in possession of important biological data and in position to use them in generalizations.

A short note is read at once; a long paper is laid aside for future study and all too often is never digested.

L.O. Howard,
Editorial in Ent.Soc.Wash.

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